

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Confirmation No.: 4379

M. TORRES et al.

Serial No.: 10/517,386

Examiner: Tarazano, Donald Lawrence

Filing Date: June 3, 2005

Group Art Unit: 1786

For: NON-WOVEN FABRIC

Commissioner of Patents  
PO Box 1450  
Alexandria, Virginia 22313-1450

**DECLARATION UNDER 37 C.F.R. 1.132**

Sir:

Professor Paul Luckham declares as follows:

1. I have reviewed the Office Action dated May 12, 2010, issued in connection with the above-identified application, as well as the Laurent reference relied upon by the Examiner.

2. I am a co-inventor of the above-identified application. I hold a BSc. in Chemistry from the University of Bristol and a PhD in Physical Chemistry also from the University of Bristol. The research for my doctorate was in the area of heteroflocculation of colloidal particles. I worked as a research associate in the Cavendish Laboratory, at Cambridge University from 1981 to 1983. I have been employed by Imperial College London since 1983, holding positions as a Lecturer in Colloid Science and Biotechnology, Chemical Engineering Department, from 1983 to 1992, as a reader in Particle Technology, Chemical Engineering Department, from 1992 to 1996, finally being appointed Professor in Particle Technology, Chemical Engineering Department in 1997. My principle area of research is to try to control the bulk properties of suspensions by controlling the interactions between the particles in a suspension. In 2003, I established Fabrican Ltd. as a start-up company with Dr. Manel Torres, who is a co-inventor on the present Application. Fabrican Ltd. is focused on the research and development of spray-on fabric which can then be used across a number of market sectors, including the Fashion & Design, Medicine, Hygiene and Automotive industries. I currently also hold the position of Scientific Director with Fabrican Ltd.

3. As to compositions for forming a fabric by spraying onto a supporting surface, a person of "ordinary" skill in the art has education and practical experience of about the following level: a degree in chemistry or another physical science, and about 5 years experience as a formulation scientist. Examples of positions held by such a person of "ordinary" skill in the art include, for example, a formulation scientist. Examples of where such a person of "ordinary" skill in the art would work include, for example, coatings or papermaking industry. In paragraph numbers 4, 5 and 6 below, I set forth how a person of ordinary skill would have thought about Laurent at the time of the invention claimed in this Application.

4. In Laurent, the boiling point of the diluent is not taught as being significant. A person of ordinary skill in the art reading Laurent would have found the use of water to be completely unremarkable, and not a reagent to be avoided.

5. Laurent do not teach the formation of a non-woven fabric, nor does Laurent teach or even suggest that the composition may form a non-woven fabric by spraying onto a supporting surface. Laurent teaches little about the application of the formulation. Laurent is completely silent as to why the person skilled in the art would even consider using a diluent other than water. In particular, Laurent does not at any point suggest that it would be beneficial for the diluent to have already evaporated by the time the sprayed material reaches the supporting surface onto which it is sprayed. Laurent discloses a water-based composition comprising mud fibers and cellulose (fibers), methylcellulose (binder) and water (diluent), in which the binder is dissolved and the fibers are dispersed - see Example 1 of Laurent. The water-based composition of Example 1 is used in Examples 2-6 as a fibrous binder in which other fibrous materials and components are suspended. The resultant compositions are used as decorative coverings. The water-based compositions are liquid in phase and are applied to a surface using a paint roller or a lower pressure gun (see Page 3 of the machine English translation). The reason a paint roller or a low pressure gun is used to apply the compositions of Laurent is because these compositions are liquid, paint-like compositions and must be applied in such a manner so that they will adhere to the surface to which they are applied.

6. In contrast, the claimed composition forms a non-woven fabric - this fabric is formed by spraying. During spraying a multitude of jets emanate from the spray gun and as these jets are propelled onto the supporting surface, the diluent, having a low boiling point, evaporates, leaving behind fibers. It is these fibers which attach to the surface and which form the non-woven fabric. Continuous spraying of the claimed composition enables layers of fibers to build up on each other. The diluent has a low boiling point and evaporates readily under pressure. The fibers are formed before they come into contact with the supporting surface. If water is used as the diluent, fibers do not form and the end-result is a liquid spray reaching the supporting surface, as the water has not evaporated from the water jets - such a process produces a film rather than a non woven fabric.

7. We have prepared two compositions for comparison. The first composition is prepared in accordance with Example 1 of Laurent. The second composition is a composition according to the invention wherein the diluent is acetone. Details of the compositions and experimental procedure are set out below:

#### Composition 1

This composition is prepared in accordance with Example 1 of Laurent.

Reagents:-

1) CELLULOSE: Cellulose Powder from FLUKA

Fiber Length: 0.01-0.10mm

2) METHYL CELLULOSE: Methyl Cellulose from SIGMA

Mn=40  
DS=1.60-1.90  
Viscosity= 400cps

- 3) WATER
- 4) BACTERICIDE

Laurent does not disclose a specific bactericide. Accordingly, ethanol, which is a well-known bactericide, is used in the experiment.

#### **Experimental Procedure:-**

- 1.1 12 grams of the cellulose powder was added to 68mls of water (density of water is 1) and stirred for 15 minutes to produce a 15 wt% mud;
- 1.2 1 gram of cellulose powder is added to the 15 wt% mud under stirring;
- 1.3 1 gram of methylcellulose is added to the mud under stirring;
- 1.4 0.63mls of ethanol (0.5 grams based on density of ethanol of 0.789 g/cm<sup>3</sup>) is added to the mud under stirring;
- 1.5 The mud is stirred for 30 minutes at medium agitation and a smooth, homogenous paste is formed;
- 1.6 A further 18mls of water was then added to the resultant mud under stirring.
- 1.7 The composition is ready to use. All steps were performed at room temperature of 20°C.

#### **Composition 2**

This composition uses acetone as a diluent.

#### **Reagents:-**

- 1) CELLULOSE: Cellulose Powder from FLUKA  
Fiber Length: 0.01-0.10mm
- 2) POLYVINYL ACETATE (PVA): From Sigma-Aldrich,  
Molecular weight 140,000
- 3) ACETONE

**Experimental Procedure:-**

- 2.1 10 grams of cellulose powder was added to 80 mls of acetone and stirred for 15 minutes;
- 2.2 13.5 grams of polyvinyl acetate were added to resultant mixture under stirring;
- 2.3 The resultant mixture was stirred for 30 minutes at medium agitation.
- 2.4 The composition is ready for use. All steps were performed at room temperature of 20°C.

**Spraying procedure**

100 mls of the composition to be sprayed was loaded into the chamber of a paint spraying gun. The composition was sprayed from a distance of 50-100 cm onto a supporting surface made from aluminium.

**Results**

Photographs of what was observed when Composition 1 is sprayed onto a supporting surface are attached as Exhibit "A".

Photographs of what was observed when Composition 2 is sprayed onto a supporting surface is attached as Exhibit "B".

As can be seen from Exhibit "A", Composition 1 is a liquid when sprayed and runs off a vertical supporting surface. Thus, Composition 1 does not form a fabric when sprayed onto a supporting surface.

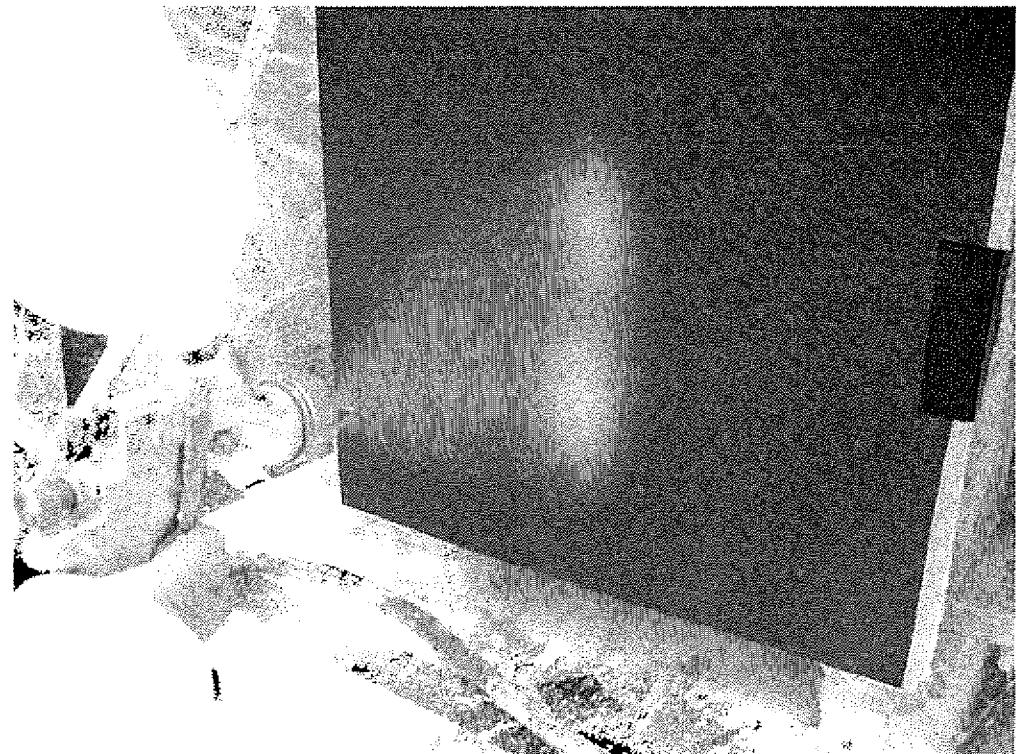
As can be seen from Exhibit "B", the Composition 2 forms a solid fabric when sprayed onto a supporting surface.

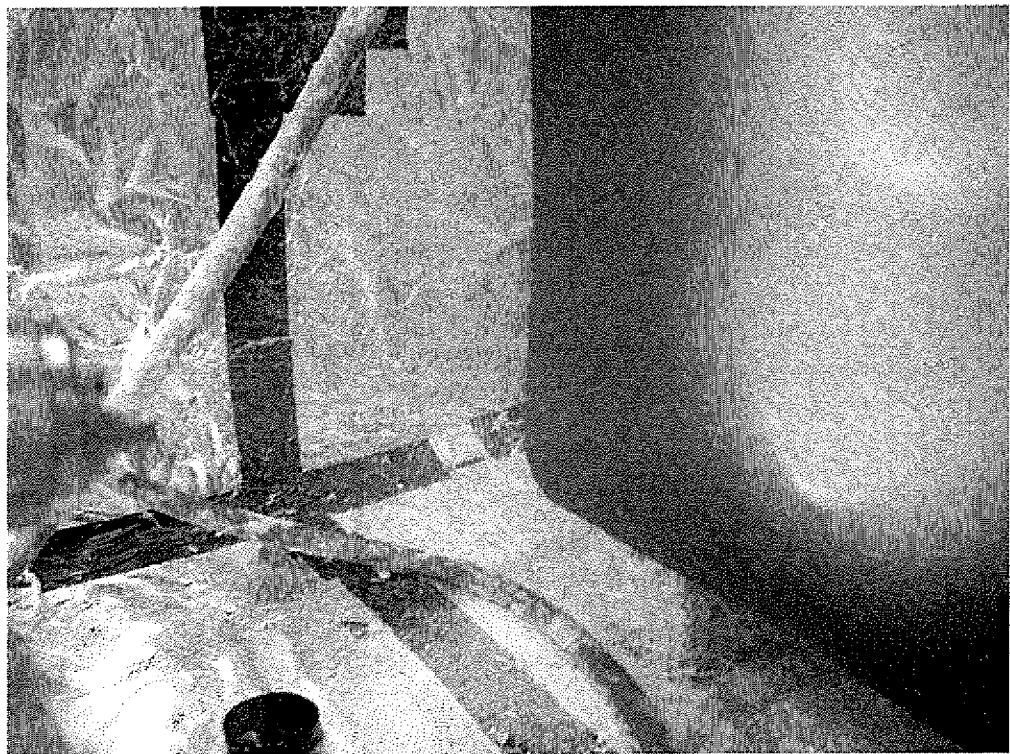
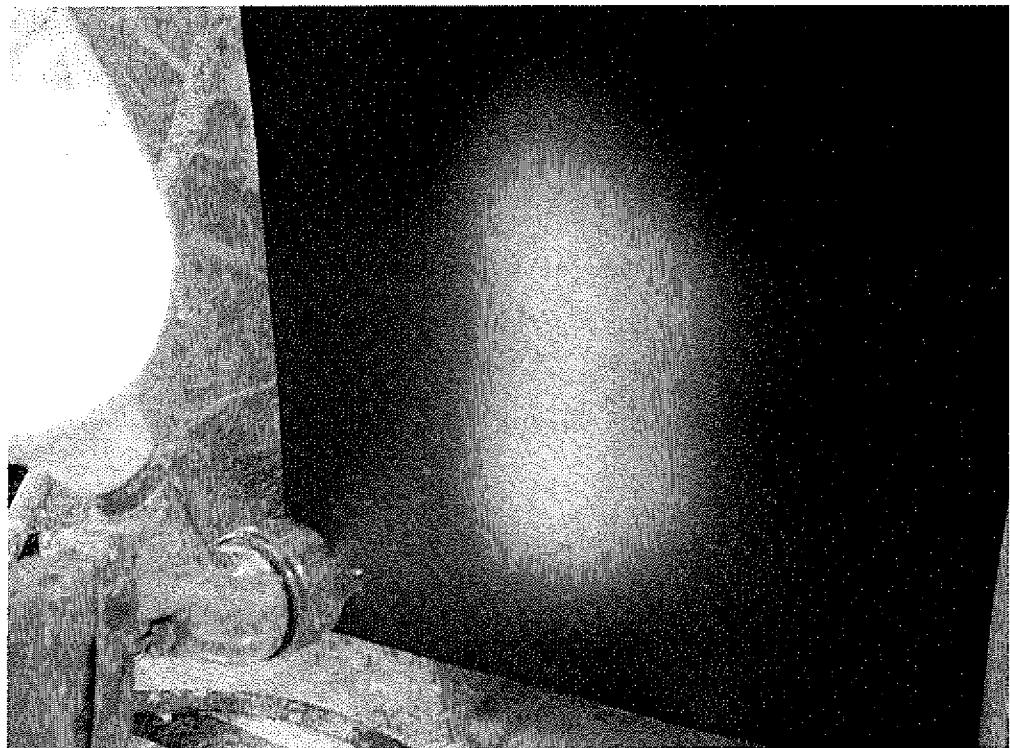
I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application and any patent issuing thereon.

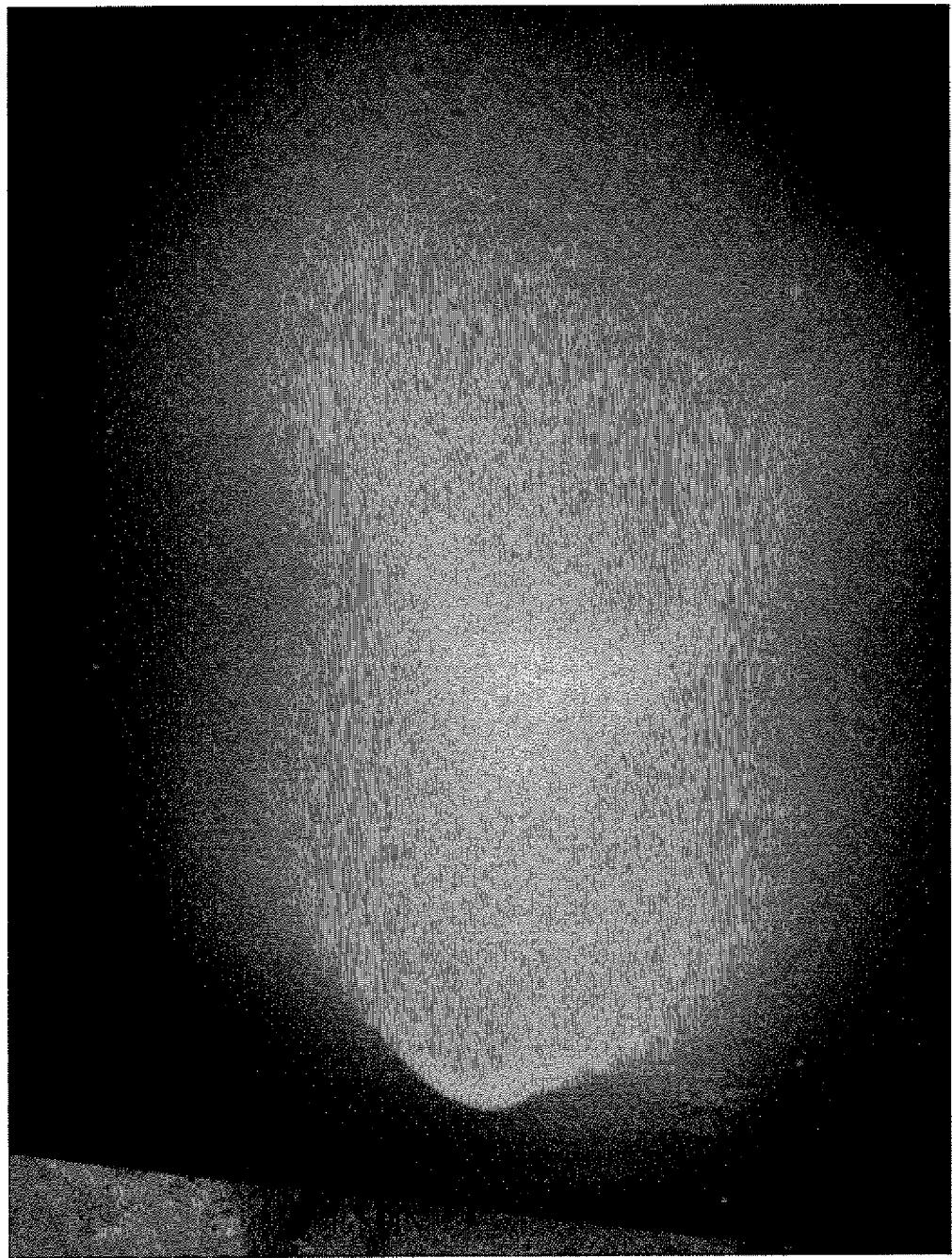
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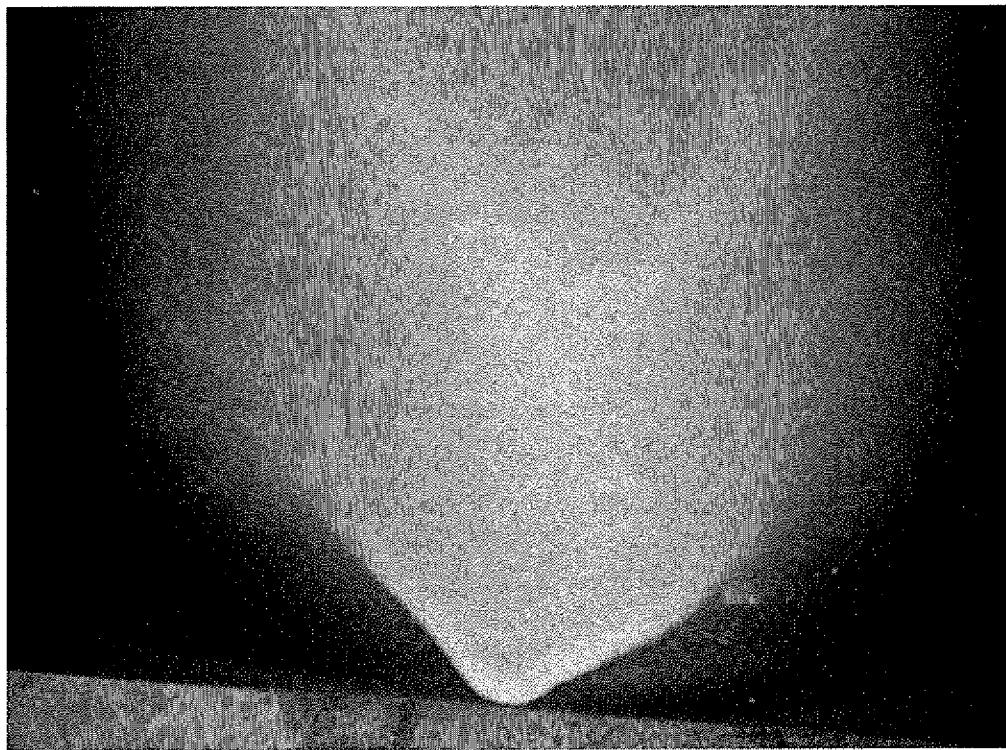
P. J. Luckham  
Paul Luckham

**EXHIBIT "A"**









**EXHIBIT "B"**

